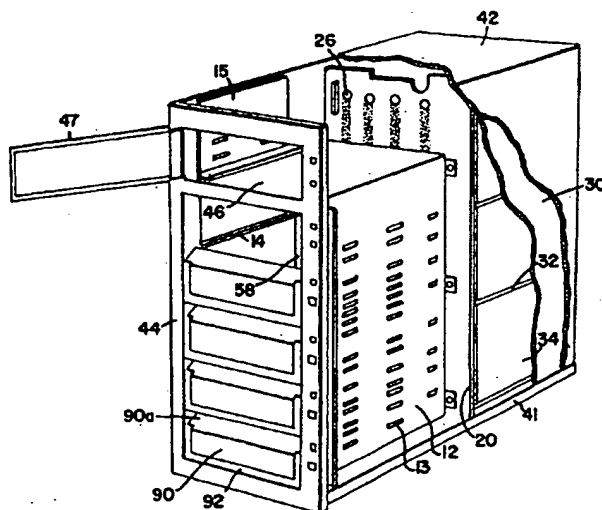




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(74) Agent: BOGUCKI, Raymond, A.; Merchant, Gould, Smith, Edell, Welter & Schmidt, Suite 400, 11150 Santa Monica Boulevard, Los Angeles, CA 90025 (US).		<p>Published</p> <p><i>With international search report.</i></p> <p><i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p> <p>(88) Date of publication of the international search report: 15 January 1998 (15.01.98)</p>	

(54) Title: ENCLOSURE FOR REMOVABLE COMPUTER PERIPHERAL EQUIPMENT



(57) Abstract

An enclosure system for receiving a number of plug in computer peripheral devices, such as hard disk drives in a disk array, utilizes front and rear cages or enclosures (12, 30) that are separated by a vertical backplane (20) having internal circuit interconnections and multi-pin docking connectors (22, 24) on each face. A front bezel (44) provides access to the backplane (20) through the front cage enclosure (19), so that trays containing the drives (71) can be inserted and plugged into the connectors (29). The vertical spacing is arranged to be modifiable, so that different numbers of higher profile and lower profile devices can be used. Power supplies (34), battery back up units (40d) and a cooling fan device (39), all arranged in sub-modules insertable through the rear open face of the power supply enclosure, interconnect with connectors (24) on the back face of the backplane (20), and cooling air is circulated throughout from front to rear, via apertures (26) in the backplane (20).

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 97/08100

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 G06F1/18 G11B33/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 G06F G11B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	"MULTIPURPOSE SYSTEM PACKAGE" IBM TECHNICAL DISCLOSURE BULLETIN, vol. 38, no. 2, 1 February 1995, pages 347-350, XP000502500 see the whole document	1,10,25
A	US 5 247 427 A (DRISCOLL EDWARD K ET AL) 21 September 1993 see column 4, line 11 - line 65; figures 1,2	1,10
A	EP 0 464 658 A (IBM) 8 January 1992 see column 4, line 45 - column 6, line 14; claim 1; figures 4-7	1,10
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

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Date of the actual completion of the international search

12 November 1997

Date of mailing of the international search report

27.11.97

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 97/08100

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 853 830 A (CORFITS WILLIAM D ET AL) 1 August 1989 see column 2, line 28 - column 3, line 2; figure 1	1,10
A	--- "DASD MOUNTING SYSTEM" IBM TECHNICAL DISCLOSURE BULLETIN., vol. 36, no. 11, 1 November 1993, pages 491-492, XP000424925 see the whole document	25
A	--- BAUMAN B: "REMOVABLE DISKS CAN HELP TO OPTIMIZE ARRAY STRATEGIES" COMPUTER TECHNOLOGY REVIEW, vol. 12, no. 10, 1 August 1992, pages 37-38, 40 - 41, XP000301200 see page 38, right-hand column, paragraph 2 - paragraph 3; figure 2 -----	25

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 97/08100

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see annexed sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

1-16, 25, 26
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/ US 97/08100

FURTHER INFORMATION CONTINUED FROM PCT/ISA210

1. Claims: 1-16

Enclosure for removable computer peripheral equipment comprising front and rear cage enclosures separated by a backplane circuit board.

2. Claims: 17-19

Holder for containing a peripheral device comprising a tray and front and back end panels.

3. Claims: 20,21

Front face interchangeable control switch/display arrangement.

4. Claims: 22-24

Mechanism for facilitating removal of a computer peripheral device using a handle.

5. Claims: 25,26

Arrangement for enabling different height units to be accommodated in an enclosure.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern. Application No

PCT/US 97/08100

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5247427 A	21-09-93	AU 667719 B	04-04-96
		AU 4167093 A	03-03-94
		CA 2100938 A	27-02-94
		EP 0584979 A	02-03-94
		JP 6267262 A	22-09-94
		US 5343357 A	30-08-94
		US 5490723 A	13-02-96

EP 0464658 A	08-01-92	DE 69112145 D	21-09-95
		DE 69112145 T	02-05-96
		JP 1931930 C	12-05-95
		JP 4281508 A	07-10-92
		JP 6064507 B	22-08-94
		US 5193050 A	09-03-93

US 4853830 A	01-08-89	CN 1040299 A,B	07-03-90
		CN 2111617 U	29-07-92
		DE 68924920 D	11-01-96
		DE 68924920 T	20-06-96
		EP 0333616 A	20-09-89
		JP 1282897 A	14-11-89
		JP 2559828 B	04-12-96
		JP 8227756 A	03-09-96
